

MISSOURI

resources

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CLEAN  AIR

director's comment



It seems to me the winter months lagged on longer this year in Missouri. As much as I love the four seasons, I'm always thrilled when the spring peepers, sweet William and mayapples arrive, as it suggests winter has lost the battle of the seasons for a time. It also means it is time to find the hidden garden tools, fishing poles and other outdoor gear and get back outside to experience Mother Nature firsthand.

I am fortunate to have grown up in a family that valued time afield – whether it was fishing, hunting for mushrooms or other grand outdoor adventures. The land ethic of caring

for and respecting Missouri's outstanding natural resources is a value that goes back generations in my family, and passing that ethic on is critically important to me. Many of today's children seem not to be aware of or motivated (affected) by this ethic. Instead of spending time outside, many children seem to prefer time on the computer, playing video games or watching reality TV shows on cable. The reality is – we need to help our children also enjoy the simpler things in life and help them connect with nature.

Providing children and teachers with educational material about our natural resources has been a part of this agency for many years. However, in the most recent years, these efforts were scaled back. One of my priorities, as director, is to increase the Department of Natural Resources' environmental education efforts.

Last month, the department initiated an environmental camp for 420 seventh graders from the Columbia area. To create a lasting environmen-

tal experience for these students, we held four camps in one of Missouri's outstanding, natural and environmental settings – Mark Twain State Park. The goal of the camps was to help teach children about being a good steward of the earth. To maximize this experience, we wanted them to learn outdoors through hands-on experiences and that's exactly what they did. Read more in the news briefs section of this issue.

It was very exciting to witness these students connecting with nature through the DNR environmental camps and we look forward to scheduling even more camps in the future. I truly believe these experiences will help foster a lifelong appreciation of Missouri's natural resources for these Missouri youth. As for the rest of us, it's time to say goodbye to winter and head outdoors!

Sara Parker Pauley
Missouri Department of Natural Resources

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Mission Statement

The mission of the Missouri Department of Natural Resources is to protect, preserve and enhance Missouri's natural, cultural and energy resources.

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Editor
Stuart Westmoreland
Public Information Coordinator
Andrew Richmond
Design Director
Belinda Hughes
Photographer
Scott Myers
Circulation
Luke Petree
Editorial Board
Larry Archer
Hylan Beydler
Kerry Cordray
Dalena Hardy
Sue Holst
Byron Murray
Stuart Westmoreland

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E-mail address: moresdnnr@dnr.mo.gov
MoDNR home page: dnr.mo.gov
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Above: Horses share their pasture with wind turbines outside of King City in Gentry County.

Front Cover: An acrobat ant works his way up a morning glory vine.

Back Cover: Dillard Mill State Historic Site interprets one of Missouri's best-preserved grist mills. The large metal and wood bevel gears in the turbine room transfer power from the turbine to the machinery inside the mill.

DNR photos by Scott Myers.



The Darker Side of Ozone

by Mark Conner and Karl Fett
photographs by Scott Myers

Most people have heard of ozone. Often a topic in middle school science classes, budding scientists learn about this upper layer of our atmosphere that filters out harmful radiation from the sun.

And, yes, our middle school science teachers were telling us the truth. When ozone is 10-30 miles up in the atmosphere – it is definitely a lifesaver.

But, there is another side to ozone – a darker side known as ground-level ozone, which exists near the surface of the earth. If the upper-atmosphere ozone were Dr. Jekyll, ground-level ozone would be Mr. Hyde.

Ground-level ozone, also referred to as smog, is harmful to just about everything. It makes you cough, have trouble breathing and can even stunt plant and crop growth.

Like ticks and wet socks, there is nothing good about ground-level ozone.

Where Does it Come From?

There is not a factory or source that belches out pure ground-level ozone. It forms when pollutants meet in the air, get heated by the sun and react.

The two main air pollutants that combine to form ozone are volatile organic compounds and nitrogen oxides.

Volatile organic compounds are compounds that contain carbon and easily evaporate, or give off fumes. It is the presence of carbon in these compounds that makes them “organic.” There are many, many different types of volatile organic compounds. Regular unleaded gasoline, for example, contains VOCs that enter the atmosphere.

Nitrogen oxides come from cars, power plants and industrial plants. They are a common byproduct of combustion. If it involves fire, heat or explosions, then it probably emits nitrogen oxides.

If it is a hot sunny day, these VOCs and nitrogen oxides meet in the air, undergo a chemical reaction and form the troublesome ground-level ozone.

Health

So, just how bad is ground-level ozone for you?

There have been many studies that have linked ground-level ozone to asthma attacks, irritated throats and difficulties breathing when exercising outside. There also have been connections to respiratory illnesses like pneumonia and bronchitis.

Throughout the year, the amount of ground-level ozone in our air varies. Even in Missouri’s largest cities, where there are lots of cars, factories and other sources of volatile organic compounds and nitrogen oxides, ground-level ozone levels can be quite low from November through March.

Much like baseball, ground-level ozone is largely a summer phenomenon. In fact, ozone has an official season which begins April 1 and ends Oct. 31 – again, almost identical to the national pastime. It’s more likely during these months to see unhealthy ozone levels since ground-level ozone requires heat in order to form.

Breathe Easy

But just how do we measure the level of ozone in the air? Ozone is typically measured in parts per billion or parts per million. These measurements are a way to express the amount of ozone compared to the rest of the air.

The Missouri Department of Natural Resources maintains ground-level ozone monitors across the state. The majority are located in, or near, the highly populated areas of St. Louis, Kansas City, Springfield and Cape Girardeau/southeast Missouri. The department selects the locations for the ozone monitors based on where ozone formation

could be the highest and in areas with potential air pollution problems.

The data from these monitors is used to compare Missouri’s air quality to the Environmental Protection Agency’s National Ambient Air Quality Standards.

The EPA has different standards, or levels, for a variety of air pollutants, including ozone. If the amount of an air pollutant is above the standard, it is considered harmful to public health and the environment.

The national air quality standard for ozone is currently set at 75 parts per billion, although EPA will likely be implementing a new – possibly stricter – standard by the end of July 2011.

To determine if an area’s ozone levels are above or below the national standard, the department averages some of the highest ozone values from each monitor during a three-year period. If this average exceeds the current ozone standard, then the area in which the monitor is located is considered to be an ozone nonattainment area.

If an area is considered nonattainment, certain steps will have to be taken to reduce ozone levels. The department works with the community to develop strategies on how to lower ozone levels and protect human health and the environment, while working toward economic viability for that area.

Getting Better

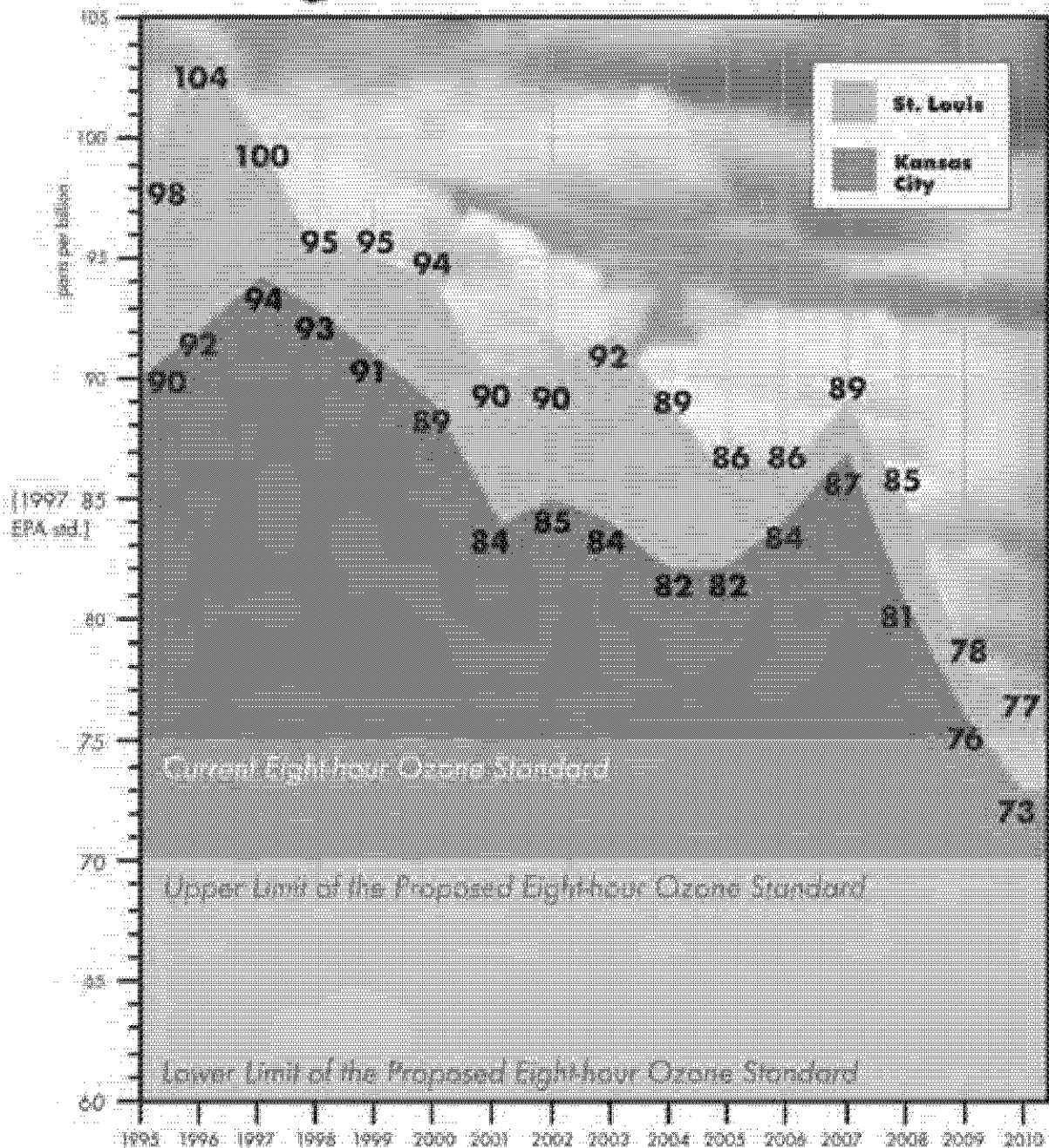
One might think that as energy demands increase and populations continue to move to urban areas, ozone levels would be on the rise. However, Missouri’s large metropolitan areas have made good progress in controlling their ozone levels.

In major metropolitan areas, like Kansas City, a special kind of gas – known as reformulated gasoline, is used during ozone season. In St. Louis, a special blend of gasoline is sold year round. This blend burns much more completely and doesn’t create as much pollution as the regular mixture.

The department’s Air Pollution Control Program continually works with businesses in the state to develop effective ways to reduce pollution. The department also has a number of diesel-emission-reducing pro-



Eight-hour Ozone Values*



* The plotted values represent an average of three consecutive years of ozone monitoring data for air quality monitors in St. Louis and Kansas City. Violations occur when these averaged ozone values exceed the ozone standard. The Environmental Protection Agency is currently re-reviewing the 2008 standard (75 parts per billion) and is anticipated to propose a lower level. EPA is expected to announce the new standard in July 2011.

grams designed to improve air quality. Emissions from diesel engines also are a major contributor to ozone (see One Last Word, page 25).

Through these programs, grants are given to diesel fleet owners and operators – public and private – to help with the cost of

retrofitting existing diesel equipment or replacing old equipment with new, less polluting models. A number of schools in the St. Louis, Kansas City and Springfield areas have upgraded or replaced some of their school buses through these programs. And, of course, there is a program known well to

St. Louisans – the Gateway Vehicle Inspection Program, jointly administered by DNR and the Missouri State Highway Patrol.

The Gateway Vehicle Inspection Program is part of Missouri's continuing effort to improve air quality in the St. Louis region, an area which has historically struggled with controlling ground-level ozone. GVIP is a required combined emissions testing and safety inspection program for vehicles registered in the St. Louis area.

Through this program, emission control systems on vehicles are tested and problems can be detected that may not be noticeable just by looking. This way, motorists know what repairs and preventive maintenance are needed to ensure that their vehicle's emissions system is operating correctly, efficiently and legally.

And, there are the efforts of the average citizen. Such simple acts as riding a bike instead of driving, waiting to mow until evening when temperatures have cooled off and installing energy-efficient appliances can, and have, had a cumulative effect on reducing ozone.

Missouri's air has actually improved during the past 80 years, but it can still get bet-

ter. There's still work to do. A new, more protective ozone standard might mean cities and areas will need to refocus their pollution reducing efforts. A new standard might also mean that areas that did not think they had an air pollution problem might find out that they, too, have work to do.

We don't really have a choice when it comes to breathing. By continuing its efforts to monitor and reduce ground-level ozone levels across the state, the Missouri Department of Natural Resources will work to ensure all Missourians have clean air to breathe. ☀

Mark Conner is a public information specialist in the department's Hazardous Waste Program. Karl Fett is a special projects coordinator in the department's Air Pollution Control Program.



Improving the Air: What You Can Do

**More than half of air pollution is caused by individuals doing their usual daily routines
– like turning on lights, driving to work and mowing the lawn.**

Everyone can help a little and most of these ideas can actually save you money.

In the Car:

- Try walking, biking or taking the bus.
- Stop at the click when gassing up the car. Overfilling allows ozone-causing vapors to escape.
- Keep your car tuned up – check tire pressure, change the air filter and maintain the fluid levels. This reduces exhaust and saves gas.
- Don't idle if parked for more than a minute.

At Home:

- When replacing appliances, buy energy-efficient ENERGY STAR® models. The less electricity you use at home, the less coal or other fuel is burned at the power plant. This also means fewer air pollutants are emitted by those plants.
- Turn down the thermostat in winter and up in the summer and insulate your house to keep that cool or warm air inside. Fixing leaks around doors and windows saves money on utility costs.
- Use compact fluorescent bulbs and LEDs.

Outside:

- Take household trash to a transfer station or to the landfill. Avoid burning leaves or grass clippings.
- When grilling, use a chimney lighter or a propane grill. Charcoal lighter fluid emits vapors that can contribute to the formation of ground-level ozone.
- Mow the grass before 10 a.m. or after 7 p.m. In the warmer parts of the day, mower exhaust gases contribute to ground-level ozone.

At Work:

- To save gas and reduce emissions, teleconference and telecommute when possible.
- Carpool to work and meetings.
- Reduce wastes. For example, paper can be saved by duplexing copies. When possible, avoid printing documents altogether. Monitor what you print for a day. You'll be surprised how much can be avoided.
- Turn off lights and computers after work.

asbestos: the invisible hazard

by Darcy A. Bybee
photographs by Scott Myers

asbestos-related disease shows up. This does not mean you need to be afraid or start costly and unnecessary renovations to your home. But it is important to be aware of the potential risks of this invisible hazard.

History and Use of Asbestos

Asbestos use in the United States began around the 1890s and it was used extensively in building materials from the 1940s to 1970s. Asbestos fireproofing was installed in military ships beginning in World War II.

In previous years, asbestos was found in more than 3,000 products. These included wall, floor, ceiling, roofing and siding materials, vehicle brake pads, piping, gaskets and even paint. Asbestos has even been used in cigarette filters, laboratory countertops, hair dryers, oil lamp wicks, oven mitts, theatre stage curtains, artificial snow and in movies. Asbestos was used in *The Wizard of Oz* to make the Wicked Witch's broom burn – without burning up.

Today, some of the more common places it is found around the house – even in new construction – are flooring products, roofing shingles and drywall mud. With thousands of historical uses, asbestos will continue to be an important health-related issue for all of us to keep in mind.

Sinister ... but Special

Asbestos has some very unique and marketable qualities. It is relatively cheap and accessible, and is a naturally occurring mineral fiber found in approximately 20 states

When the St. Louis Army Ammunition Plant was dismantled in 2006, the old asbestos-containing panels that blanketed the site had to be carefully removed from the facility.

So you have just purchased a new home and you are ready to make it your own. Do you realize that even a newly constructed home could contain building materials that contain asbestos? If these materials are disturbed, weathered, torn or otherwise damaged, they could release microscopic asbestos fibers into the air. If you inhale these fibers, it could take decades before any signs or symptoms of an

and several countries. It is fire- and chemically resistant and a poor heat and electrical conductor. Pound for pound, asbestos is stronger than steel. These characteristics make it an invaluable addition to products with the need for increased strength but that need to remain light. Insulation products and items requiring fire resistance also benefit from asbestos content.

Unfortunately, asbestos has a downside that is clearly insidious. Asbestos fibers are so small that when inhaled, they are able to travel deep into your lungs where they may wedge into lung tissue. Your body does its best to expel these intruders when you breathe or cough, but if expulsion fails, it will attack the fibers and form scar tissue around them. This scar tissue can be the basis of an asbestos-related disease.

These are not the only health issues linked to asbestos exposure. Other diseases include cancers of the larynx, esophagus, stomach, colon-rectum, kidney and pancreas (see chart on page 8).

The World Health Organization estimates more than 107,000 people die annually from asbestos-related lung cancer, mesothelioma or asbestosis resulting from workplace exposures. In fact, it is estimated that one in every three deaths from occupational cancer is caused by asbestos. In addition, according to the WHO, several thousand people die annually from diseases related to asbestos exposure in their own home.

What Does the Department of Natural Resources do About Asbestos?

The Missouri Department of Natural Resources regulates the renovation and demolition of regulated structures. A regulated structure, in general, is a public, commercial or industrial building – or any building that has ever been used for a public, commercial or industrial purpose. Examples include schools, courthouses, beauty parlors, bowling alleys, convenience stores and similar buildings. This also includes private residences that have never been used for other purposes, providing they were part of a larger project.

The Department of Natural Resources has inspection, notification, removal and waste disposal requirements for all projects that fit into this category. The department also certifies the contractors, individual workers, inspectors and companies that train the individuals. In Missouri, the ma-

jority of the Environmental Protection Agency's asbestos regulations have been delegated to the department's Air Pollution Control Program.

Isn't Asbestos Banned?

Asbestos has been banned in whole or part in dozens of countries. The United States has initiated only a partial ban. The only applications currently banned in the United States are most spray-applied surfacing and thermal system insulation materials, as well as asbestos-containing papers and flooring felts. Any new uses of asbestos also have been banned. It is important to note that with thousands of existing uses for asbestos, it still can be found in many places in our homes and surroundings.

Is This Stuff Asbestos?

You cannot tell by looking at a material if it contains asbestos – though a person with experience may recognize materials which commonly do. The only way to know for sure is to have it sampled by a trained and certified asbestos inspector and analyzed by an accredited laboratory. If you are unable to have an inspection of the material completed, the best thing to do is to assume that it may contain asbestos.

Depending upon the type and condition of the material, it may be appropriate to cover it by painting a ceiling or laying linoleum over suspected asbestos tiles, but this will not get rid of the hazard, if present. If future renovations take place, you must remember its potential presence to avoid creating a health risk.

Asbestos removal requires special training, equipment and site preparation to minimize risk and maximize safety for workers and the general public.





Asbestos Health-Related Risks

Disease	What happens?	Symptoms	Latency period *	Treatment
ASBESTOSIS	Scarring of the lungs	Coughing, shortness of breath, crackling sounds in lower lung, clubbing of fingers	10-20 years	Irreversible; only known cure is a lung transplant
MESOTHELIOMA (rare)	Cancer of the lining of the lungs or the abdominal cavity.	Few symptoms in early stages; extremely painful	20-40 years	Usually fatal – life expectancy 3 months to 4 years from diagnosis
LUNG CANCER	Malignant tumor of the bronchi covering	Persistent cough, enlarged lymph nodes	20 years	Various treatment methods

* time between exposure and onset of symptoms

source: Environmental Protection Agency

(Top) The asbestos-containing materials at the St. Louis Army Ammunition Plant were in poor condition and required a registered asbestos abatement contractor for their removal. Asbestos was often used in industrial and military applications where fire and chemical resistance were important.

Often, asbestos-containing materials are in poor condition, perhaps because of water or fire damage. If you wish to remove them, the best course of action is to contact an asbestos inspector or a registered asbestos abatement contractor and have it safely removed and disposed.

If the asbestos-containing materials are in good condition and proper methods are used, it may be cheaper to remove them yourself. However, the long-term cleanup and health costs – not to mention legal liability – may be far greater.

Contact Us First

Before you or your contractor begins any removal job, please contact the department's Air Pollution Control Program to determine if your project is subject to regulation. A list of certified asbestos removal contractors is regularly updated online at: dnr.mo.gov/env/apcp/asbestos.htm.

Once you hire a contractor, you may wonder what to expect. Do you see visions of people decked out in plastic suits with masks working in a room cloaked entirely in plastic and duct tape? Depending on your

specific project, that might be an apt description. According to regulations, certain asbestos-related activities require this type of setup. These precautions are necessary to minimize the movement of asbestos fibers from the work area to the rest of your home. If you hire someone and suspect that they may be doing something wrong, it is appropriate to report it.

Asbestos is just one of the many hazards we all may encounter in our homes or workplaces. Lead, mold, chemicals, electrical hazards and other risks too numerous to mention are potential indoor risks we cross paths with every day. Be aware of your surroundings and if something appears to be unsafe, check out your suspicions with a qualified professional.

The Air Pollution Control Program can be reached at 573-751-4817 or visit the asbestos webpage listed earlier to learn more about asbestos, its health-related risks and regulatory requirements. 🌞

Darcy A. Bybee is an environmental specialist in the department's Air Pollution Control Program.

Idling

by Mark Conner
photographs by Scott Myers



It's 2:50 on a weekday afternoon. A long line of cars, trucks and minivans stretches around the corner. Parents and grandparents wait patiently, flipping through radio stations and checking cell phones.

Soon the bell will ring, kids will filter out of the school and as teachers direct traffic, car doors will open and close and the line of cars will slowly shorten.

It's a tradition repeated day after day, year after year in most Missouri towns.

Greg Pelkey, sustainability and energy manager with Springfield Public Schools, was in the process of starting an environmental study at one of the district's elementary schools when he walked outside and saw the long line of cars.

Then it clicked.

"This is crazy," Pelkey thought as he saw the long line of cars waiting, engines running. Idling.

One of the school district's focuses has been to continually improve indoor air quality. As he took in the scene that afternoon, Pelkey realized as soon as the kids left school for the day, that they "walk right into bad air" from the idling cars' exhaust. Pelkey discussed the problem with Doug

Neidigh, who is with the Ozarks Clean Air Alliance, a local group that works to improve air quality in a 15-county area in southwest Missouri. In turn, they contacted the Department of Natural Resources.

The goal was to reduce unnecessary idling at school campuses by creating no-idle zones at the schools. Pelkey compared it to a no-wake zone some lakes have near docks and swimming areas.

Neidigh had been involved with many air pollution reduction projects in southwest Missouri, working with the department and other groups. Even though creating no-idle zones at campuses across one of Missouri's largest school districts had not been done before, he was not deterred.

The school was on board and the department's Air Pollution Control Program had offered to help.

"Because of what we had, we thought Springfield Public Schools would be a great pilot for the program," Neidigh said.

Why Go Idle Free?

Pelkey was right to take a long look at the line of idling cars. There are many reasons to reduce idling. But, there are two

Carpool lines are concentrated with idling vehicles as parents wait for their children to be released from school. Scheduling an accurate arrival time in order to reduce idling, or shutting off the engine completely, not only saves money in fuel, but reduces harmful particulate matter in the air.

“This is the perfect scenario, where the students are the ones who want to carry the message.”

Greg Pelkey - Springfield Public Schools

No Idle Facts

MYTH –

I need to warm up my vehicle's engine.

FACT –

Idling is not an effective way to warm up your vehicle – driving is. A 30-second idle at start-up to properly circulate engine oil is more than sufficient.

MYTH –

Leaving my car running uses less fuel.

FACT –

Restarting a V-6 engine uses about the same amount of fuel as idling for five seconds. Shutting off your vehicle saves you money. Idling = zero miles per gallon.

MYTH –

Restarting my engine can damage it.

FACT –

Since the early 1990s, all cars have fuel injection, which reduces oil breakdown in engines. The cost of “wear and tear” on the starter/battery is only about \$10/year. Fuel savings from idle reduction easily offset this cost.



very simple reasons to help stamp out idling: public health and money.

Vehicle emissions contribute to unhealthy levels of fine particles, ozone and air toxins.

These fine particles in vehicle emissions – known as particulate matter – can get through the body's defenses and deep into the lungs of children. There have been a number of health studies linking airborne particle pollution exposure to increased hospital admissions and emergency room visits for respiratory distress.

In the U.S., idling consumes approximately four million gallons of fuel each day – a waste of money and resources. If just 100 cars would reduce their idling time by five minutes a day, it would save 100 pounds of ozone-forming emissions and 360 pounds of carbon monoxide from being released into the air per year.

Turn it Off

With a specific goal in mind, the next obvious step was to “get the project up and running,” said Neidigh.

Working together with the department, signs and brochures were developed to help explain where the no-idle zone would be located and why there was a need for one.

Then, in spring 2010 with the signs installed and brochures printed, Springfield Public Schools, the department and the

Ozarks Clean Air Alliance kicked off the campaign to reduce unnecessary idling.

Half a year into the campaign, Pelkey said “compliance is high.” He believes it helps because parents see the value of not having their children breathing exhaust from vehicles.

He also admitted that there's still more work to continue to reduce idling around the schools.

There are some times, like the frigid days of winter, cars are allowed to idle for long periods. On these types of days, Pelkey said the message is to schedule your time so you won't have to be sitting and waiting for half an hour.

Green Team

No doubt helping the success of the campaign to reduce idling are the Springfield school districts' environmental clubs, some of which are known as Green Teams. Nearly every school in the district has some form of Green Team. These teams are made up of teachers, students and members of the Parent-Teacher Association, and they focus on environmental issues like recycling, composting and gardening. These teams and clubs go one step further than just learning, they get out and do something about it.

At the kick-off event at David Harrison Elementary School in Springfield, some of the school's local Green Team members enthusiastically ran up and down a long line of



waiting cars. The members knocked on windows of idling cars and handed out brochures that explained the health and environmental effects of idling.

This is the “perfect scenario,” Pelkey said, “where the students are the ones who want to carry the message.”

What About the Buses?

Parents aren’t the only ones waiting to pick up students after school.

Unnecessary idling of diesel school buses wastes fuel and results in avoidable amounts of toxins being emitted into the air. Similar to gasoline-powered vehicle idling, diesel emissions from idling buses further contribute to air quality problems and related health effects.

Pelkey said the Springfield school district has had a policy to reduce school bus idling for a couple of years.

“Not only to save fuel, but also to decrease emissions around the area’s schools,” he explained.

Besides the obvious health benefits around schools, one hour of reduced idling per day yields \$301.50 per year in fuel savings (see chart). Multiply this times the number of buses participating and the savings to school districts and taxpayers can add up quickly.

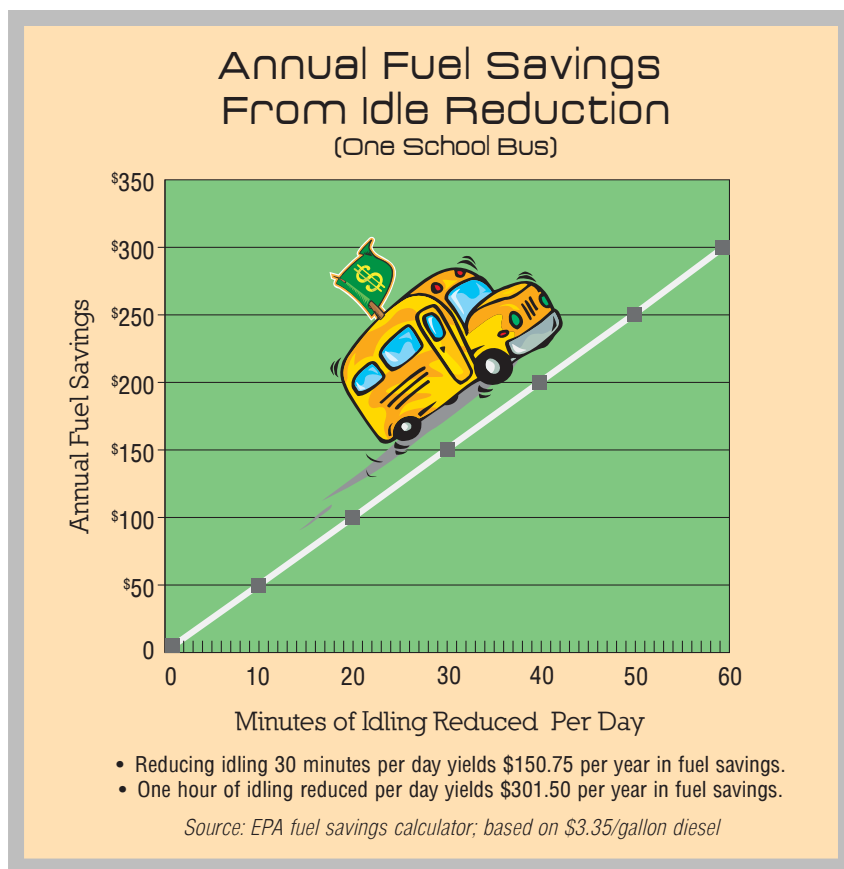
The department has developed a school bus air emission inventory for Missouri. For each school district in the state, this inventory includes the number of buses in operation, the emission control equipment installed, amount of diesel emissions discharged by the school district’s fleet and any idling policies the school has implemented.

This information assists the department in achieving the long-term goal of reducing the harmful emissions produced by diesel school bus fleets as they contribute to the formation of ground-level ozone. Also, outreach programs using this information help inform fleets with excessive or unnecessary idling about the impacts that idling has on fuel cost and air quality.

You can see your school’s idling policy and other information at: dnr.mo.gov/env/apcp/schoolbusinventory.htm.

What's Next?

Next up for the school district is to measure the success of the no-idle zones. This will likely include going out and physically counting the number of vehicles that idle during a given period of time.



Expect to see more idle-free zones. The Ozarks Clean Air Alliance “wants to use it as a model for other school districts,” Neidigh said. “It’s definitely applicable.”

Other Schools

For other schools or businesses interested in a similar program, Pelkey said the best thing is to outline a goal, an objective. Just as importantly, it’s wise to “network out.”

Many schools across the county have already implemented programs similar to the one at Springfield Public Schools. These other districts have “already gone through the headaches and challenges,” and are open to discuss their programs.

Besides creating a safe and healthy place for students to learn, Pelkey said the district wants to be a leader for the community and other school districts.

Will the success of the Springfield program encourage others to step up and help clear the air while reducing their school system’s annual fuel budget? Or, will they just sit idling by? 🌅

Mark Conner is a public information specialist in the department’s Air Pollution Control Program.

A Network That is Always on the Air

by Larry Archer
photographs by Scott Myers



Bethany Head of the DNR Environmental Services Program checks the Trost monitoring station in Kansas City. The department operates more than 100 air monitoring instruments around the state, both urban and rural.

In St. Louis, a commuter checks the local air quality posted on a roadside sign on his way home from work to determine if he'll take his evening run. On a hot July afternoon in Kansas City, a mother goes to the Internet before deciding whether it's safe for her asthmatic son to join in a neighborhood soccer game.

The information they use, whether they find it online, on the roadside or on the local radio or television weather forecast, is all generated by the same network of air

monitors located throughout Missouri and maintained primarily by the Missouri Department of Natural Resources.

The department, working with municipal air programs in St. Louis, Kansas City and Springfield, operate more than 100 air monitoring instruments at 56 locations – both urban and rural – around the state.

"Some of them may have only one instrument measuring lead or particulate matter, but some may have as many as 15 instruments at that particular location," said Celeste Koon, chief of the Air Quality Monitoring Section with the department's Environmental Services Program. Staff from this section maintain the air monitors and collect the data they produce.

The primary purpose of the network is to gather the data necessary to determine if Missouri is meeting the National Ambient Air Quality Standards (NAAQS), which are established by the U.S. Environmental Protection Agency to meet the requirements set forth in the Clean Air Act. This data will determine if certain communities must take additional steps in order to meet the required clean air standards.

"There's a set scope for the criteria pollutants, and that would be carbon monoxide, lead, nitrogen dioxide, particulate matter [PM 10 and PM 2.5], ozone and sulfur dioxide," said Stephen Hall, air monitoring unit chief for the department's Air Pollution Control Program. "Those are the seven primary NAAQS [air quality] standards that EPA (enforces)."

Most of the sites chosen for air monitors are in the metropolitan areas of the state's three largest cities: St. Louis, Kansas City and Springfield. However, increasingly demanding federal air standards are likely to require that new monitoring sites be added, according to Hall.

"With new regulations, we're starting to see more monitoring requirements for what are called "micropolitan" areas, such as Co-



lumbia and Jefferson City,” Hall said. “This is particularly true with ozone monitoring.”

While the information is needed in assessing the state’s compliance with federal regulations, it is also helpful to those who suffer from respiratory concerns such as asthma. All of the data is available on the department’s website at: dnr.mo.gov/env/esp/aqm/esp-aqm.htm, and on EPA’s AIRNow website at: www.airnow.gov. Because these sites are updated regularly, they are a good source for current air quality information.

“About 80 percent of our instruments collect continuous data,” said Koon. “The great majority of our instruments are using electronic technology, and they’re getting us our data faster. We also submit data to agencies that want to use it for the air pollution index reporting.”

“Air monitoring network data is also contributing to research to determine what other pollutants are in Missouri’s air and what effect they may have on human health,” Hall added.

“We also monitor for a suite of air toxics at our national air toxics trend station in St. Louis,” Hall said. “That monitoring data supports more research-oriented goals and toxicology research related to air pollution, not so much related to demonstrating that an area attained a particular air quality standard. So there are a number of other uses of the air monitoring data other than just compliance with the NAAQS standards.”

Good policy – whether that be setting national standards for air quality or deciding whether a child joins in a local soccer game – depends on good data. Missourians can

breathe easier knowing that there is a small army of silent sentinels deployed throughout the state keeping track of what is in the air. ☀

Larry Archer is the division information officer for the department’s Division of Environmental Quality.



New State Park Website



Check out the newly launched Missouri state park website

at: mostateparks.com. The website has been redesigned to make it more user friendly with a new color, layout and new features. New multimedia components feature videos and photographs for each park and site and new navigation paths make it easier to find what you are looking for as you plan your state park visit.

The "Choose your adventure" feature has an interactive map that lets you choose an activity and see which sites have that activity. If you click on "Find a park," you can go directly to the park or site of your choice, or get to parks by region or activity. Clicking on "Things to do" will take you to an enhanced activities page that will provide a listing of parks for 20 of your favorite activities.

For years, users have said they wanted Internet map directions to places. More than 2,000 datapoints have been added on the new website, making it easier to find all state parks and historic sites.

Largest Ever Natural Disaster Preparedness Exercise to be Held

Two months after the deadly, magnitude 9.0 earthquake in Japan, the emergency management community will hold



the largest natural disaster emergency management exercise in U.S. history.

In the planning stages for some time, this National Level Exercise (NLE 2011) is a congressionally mandated disaster preparedness exercise set for May 16-20. Federal agencies, including the White House, states, counties, cities, organizations and businesses will simulate a coordinated response to a large quake, and the resource needs that would follow.

NLE 2011 will simulate the catastrophic nature of a major earthquake in the central U.S. region of the New Madrid Seismic Zone. This year is the bicentennial anniversary of the 1811 New Madrid earthquake, for which the zone is named. NLE 2011 will be the first to focus on a natural hazard.

The department's Geological Survey program will test emergency plans including activation of the Post Earthquake Technical Clearinghouse, an information center in Rolla, for geologists and other scientists who will receive credentials to enter the affected area. It is anticipated that preliminary geologic data can aid officials in anticipating the potential for landslide, flooding and effects of further ground movement. The state geologist, environmental emergency response staff and other experts at DNR will participate with other agencies at the State Emergency Management Agency in Jefferson City and at locations statewide. Learn more at: dnr.mo.gov/nle.

New 11-mile Section of Katy Trail Opens

Gov. Jay Nixon, First Lady Georganne Nixon and State Parks Director Bill Bryan cut the ribbon to open an 11-mile portion of Missouri's Katy Trail State Park from St. Charles east to Machens. Opening the final section of the trail along the original Katy Railroad corridor marked a major milestone for the nation's longest developed rail-trail project, which opened its first section in 1990. The trail now stretches 240 miles from Machens to Clinton, in west-central Missouri. Completion of this section opens up opportunities to connect to a trail network in the St. Louis and St. Charles County area.

Before the final section could be built between St. Charles and Machens, floods in 1993 and 1995 severely damaged the corridor. Damage included two scour holes so large they could not be filled.

Using a grant from The Great Rivers Greenway, crews were able to build the trail around one of the holes

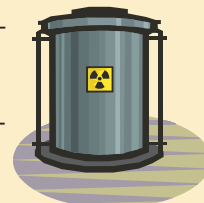
on Katy Trail property. An agreement with the Consolidated North County Levee District provided an easement along the L-15 levee so the trail could be built around the second scour hole. The Missouri Department of Transportation managed the project, which was funded through the American Recovery and Reinvestment Act.

Now that the eastern end of the Katy Trail has been completed, the effort will be focused on connecting the trail on the western end of the state via the Rock Island Trail. This section will connect to the Katy Trail at Windsor and serve as a link to provide trail access all the way to the Kansas border.

For more information on Katy Trail State Park, visit: katytrailstatepark.com.

Permit Modifications List Available Online

Facilities or businesses that actively treat, store – for more than 90 days – or dispose of hazardous waste in Missouri must get a hazardous waste permit, which lists how and what kinds of hazardous waste the facility can manage. It also lists the facility's operating conditions and closure, corrective action and financial assurance requirements.



The department or the facility can make changes to the hazardous waste permit throughout its life. Permit modifications are labeled as Class 1, 2 or 3, depending on how much they change the original permit conditions.

The public is invited to review the Missouri Department of Natural Resources' list of all approved hazardous waste permit modifications for calendar year 2010. The permit modifications list is online at: www.dnr.mo.gov/env/hwp/permits/publications.htm.

For more information or a hardcopy of the permit modifications list, contact the department's Hazardous Waste Program at 800-361-4827. Hearing- and speech-impaired individuals may reach the department through Relay Missouri at 800-735-2966.

First DNR State Park Environmental Camp Draws 420 Students



Does your school district offer an environmental camp for your seventh or eighth graders to learn more about environmental issues? Would you consider adding a camp

to your school curriculum? The Missouri Department of Natural Resources is offering students and teachers an exciting new opportunity. The department is developing an environmental camp to create a lasting environmental experience for students. DNR will hold the camps in some of Missouri's outstanding, natural environmental settings – Missouri state parks.

Research shows that teaching children about stewardship of the earth is most effective when they learn outdoors through hands-on experiences. The science coordinator of Columbia Public Schools and the administration at Lange Middle School in Columbia have agreed to pilot the first Department of Natural Resources camp. Four hundred twenty seventh graders attended the first camp in April at Mark Twain State Park near Florida, Mo. The department surveyed more than 29,000 Missouri teachers while developing the camp's curriculum.

Students and teachers will also participate in a service project determined by the state park superintendent. Mark Twain State Park needs help with a retaining wall and several cleanup projects.

Plans to expand the camp in the following years will make an education in natural resources available to all Missouri students. The department will announce future camps on its website at: dnr.mo.gov and on the Missouri State Park group camp website at: mostateparks.com/page/55138/organized-group-camps.

For more information, contact DNR's Education Coordinator at: environmental.education@dnr.mo.gov.



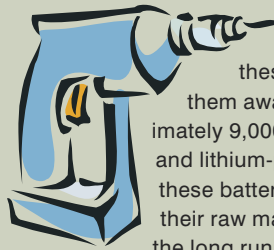
environmental notes

A Battery of Recycling Advantages

In today's always-connected world of tech gadgets and gizmos, it's easy to forget about the batteries that power our devices. Many of these gadgets are replaced as frequently as one to two years after first purchased, abandoned for the newest next-best-thing. In such cases, what should you do with the old batteries?



For many, they sit in a drawer for a while, before the inevitable round of cleaning has them placed in the trash for a trip to the landfill. Some people recycle the batteries, following advice from years ago when many rechargeable batteries contained harmful heavy metals like mercury, cadmium, and lead. With today's gadgets, this is not the case, although everyone should still turn in those old batteries for recycling. Most of today's batteries in portable devices are made using either of two battery technologies known as lithium-ion (Li-Ion) and lithium-polymer (LiPo). According to the Environmental Protection Agency, they are safe for disposal in the normal municipal waste stream. While they will not pollute if thrown away, there are still reasons to recycle them that benefit our environment, as well as our wallets.



Lithium-ion and lithium-polymer batteries contain metals such as cobalt, copper, nickel and iron. All of these metals must be mined as raw materials, so throwing them away is a waste of our natural resources. Every year, approximately 9,000 tons of cobalt is used in the manufacture of lithium-ion and lithium-polymer batteries. Up to 13 percent of the total weight of these batteries can be cobalt alone, so recycling them to reclaim their raw materials not only prevents cobalt from being mined, but in the long run, also reduces the total cost of batteries for us all.

Recycling lithium-ion and lithium-polymer batteries is easy and free. Simply take them to a local RadioShack, Lowe's, Best Buy, Sears or Staples store. These locations participate in the Call2Recycle battery-recycling program and have special collection boxes for used batteries from portable electronic devices. You can drop off any kind of rechargeable battery, including nickel-cadmium (NiCd), and nickel-metal hydride (NiMH) at these locations as long as it weighs less than 11 pounds. If you don't have one of the above businesses in your area, you can find a drop-off location by visiting www.call2recycle.com and clicking on the "Drop-off Locator" tab, or by calling the Call2Recycle helpline at 877-2-RECYCLE (877-273-2925).

State Parks Youth Corps Returns

Applications are available for youths to earn money while helping to improve Missouri state parks and historic sites. Now



in its second year, the State Parks Youth Corps provides employment for youth between 17 and 21

through Nov. 30, 2011. The program provides opportunities for valuable work experience and job skills while introducing youth to possible careers in natural resources and state parks.

Youth corps members will work in state parks and historic sites throughout the state performing a variety of tasks. Responsibilities may include painting buildings; repairing roofs and windows; planting trees and maintaining landscapes; building and clearing trails; assisting in offices and visitor

centers; providing seasonal interpretation through tours and programs; and developing and implementing social media efforts.

The State Parks Youth Corps is a cooperative partnership between Missouri State Parks and the Division of Workforce Development with its local Workforce Investment Boards. The program is funded by Workforce Investment Act 15 percent funds and youth must meet Workforce Investment Act guidelines (low income with barrier).

To apply online, go to the State of Missouri's website at: MO.gov or visit with your local Workforce Investment Board representative.

DNR Releases Revised Stormwater Guide

The Missouri Department of Natural Resources has released a revised set of guidelines aimed at helping developers and contractors better



manage stormwater runoff from construction sites and minimize erosion that contributes to water pollution.

Protecting Water Quality: A field guide to erosion, sediment and stormwater best management practices for development sites in Missouri and Kansas, is a guide to managing stormwater to aid in building a clean environment and vital community. The guide includes information on practices specifically useful in controlling erosion and polluted runoff during active construction projects.

The guide also explains the causes of stormwater pollution and its potential impact on community life. It gives contractors, planners, developers, government officials and the general public methods to coordinate best management practices and strategies to harmonize community efforts.

Updates in the revised version of the publication include state-of-the-practice design and technology, including designs with fewer or smaller detention basins and more rain gar-

den type practices. The publication explores an emerging emphasis on environmental site design and illustrates several Midwest examples. The revised book now includes a construction site inspection checklist.

The stormwater guide is available on DNR's website at: dnr.mo.gov/env/wpp/wpcp-guide.htm. For more information, call the department's Water Protection Program at 800-361-4827.

Low-interest Loans for Water and Wastewater

The Missouri Department of Natural Resources is offering low-interest loans to Missouri drinking water and wastewater facilities for energy-efficiency projects under the Energize Missouri Water – Water and Wastewater Energy Loan Program. The department anticipates awarding up to \$10 million in financing with a 3 percent APR for eligible projects. The loan program will provide \$100,000 to \$1.5 million in funding for projects to update and improve facilities with

I enjoy your publication. In the winter 2011 issue, the Environmental Notes column about lawn mowers omitted any mention of rechargeable battery operated mowers. I have been mowing our lawn for over five years with a Neutron brand mower that uses a removable, rechargeable battery. Fully charged, it can mow for two hours which is quite adequate for most city lawns. I would emphasize, it's designed for normal city size lawns – our lot is 75 feet by 120 feet.

Because it has no fluids such as gas or oil, with the battery removed the mower can be easily hung on the garage wall. An overnight charge restores full power to the battery. An added benefit is that it is no noisier than an electric fan, which the neighbors appreciate. It has also worked adequately when the grass is wet.

Joe Grimm
Glendale

Missouri Resources is a great publication, and the cover on the winter issue was outstanding. Your article on "green" lawns (Environmental Notes) states that electric mowers are "only as good as your power cord is long." Battery-powered



mowers are available – they are light, easy to push and pollution-free. I've used one very successfully for several years, just rotating between three batteries.

Jerry Eidson
Camdenton

I just wanted to say thank you for your magazine. Every page is a greeting card of valuable information. The Time Exposures entry each issue is tops – I especially enjoyed the story about the old Alton Club on the Current River (Fall 2010).

Don E. Flynn
St. Louis

Letters intended for publication should be addressed to "Letters," *Missouri Resources*, PO Box 176, Jefferson City, MO 65102-0176 or faxed to (573) 522-6262, attention: "Letters." Please include your name, address and daytime phone number. Space may require us to edit your letter. You also can e-mail *Missouri Resources* staff at moresdnr@dnr.mo.gov.

measures that will result in reduced energy costs and energy savings. Examples of eligible projects include variable frequency drives, motors and pumps, lighting upgrades, high-efficiency fans and heating ventilation and air conditioning.

"The projects implemented as a result of these loans will help local governments and water processors achieve energy savings," said Sara Parker Pauley, director of the Missouri Department of Natural Resources. "This effort also follows Gov. Nixon's initiatives to use green innovative technology to improve the environment, help create jobs and continue to stimulate Missouri's economy."

Energize Missouri Water is accepting project applications for the Water and Wastewater Energy Loan Program through a competitive application process. For more information about the program call 573-751-7466 or e-mail energyloan@dnr.mo.gov. The department is committed to working closely with businesses, agricultural entities, industries and communities to assist with funding efforts that support energy efficiency and renewable energy projects and provide financial savings to Missourians.

The department has made Energize Missouri Water loans available through funding received from the American Recovery and Reinvestment Act of 2009. The department is administering more than \$200 million in Recovery Act funding to support Energize Missouri projects to create jobs and improve energy efficiencies and renewable energy for Missouri.

Kill A Watt – An Offer You Shouldn't Refuse

Citizens can now find out how much electricity their old refrigerator is using and decide if the air conditioner is still saving money and resources by using a "Kill A Watt®" home energy monitor. This is especially good news for Rolla Public Library cardholders because the library and Rolla Municipal Utilities teamed up to make monitors available.

The Kill A Watt monitor is simple to use. Just plug it into an electric socket near each appliance – then plug the appliance into the monitor and turn on the appliance. The amount of electrici-

ty used varies. Some appliances secretly use small amounts of energy even though they are turned off. This power usage is referred to as a phantom electricity load.

Stream Team Notebook

Master Naturalists Form Their Own Stream Team

Billy Backues and Chuck Chur can often be seen wading in the streams and rivers around the Lake of the Ozarks. They come from very different backgrounds and different parts of the country, but they are bound together by a fierce love of the outdoors. Most recently a cattle rancher in Kansas, Backues spent 24 years in the Air Force and another 17 working for Boeing before retiring to the lake area. Chur moved to the lake from Minneapolis and a career in computer technology and finance. Both men came to the area in 2008 and soon became involved with the Missouri Master Naturalist Program.

In 2009, the Stream Team program hired a Volunteer Water Quality Monitoring introductory workshop in Camdenton and the rest is history.

"Stream Team offers a great opportunity for Master Naturalists to fill their volunteer requirements," said Chur. "We came for the training and then we were hooked."



Billy Backues (left) and Chuck Chur measure conductivity and temperature in preparation for winter chloride monitoring.

DNR photo by Susan Higgins

The two men are forming their own Stream Team in the lake area and at last count, have enlisted 16 members. Their goal is to get some of the younger members trained as water quality monitors so that they can monitor even more streams. Both men are quick to state that interested volunteers do not have to be a Master Naturalist to join their Stream Team.

Backues and Chur agree that their new Stream Team would love to have any new members from the area. The only prerequisite is an interest in water quality.

Currently, Chur and Backues monitor one site on Mill Creek and another on the Little Niangua River. As their team expands, they hope their monitoring sites will expand, too. Backues said that the best part of the program is "just being out there in the middle of a beautiful Ozark stream." He also admitted, "I have become a bit of a driving hazard, because I am always craning my neck when I go over a bridge to see if the water in the stream looks good."



TIME EXPOSURES



On May 27, 1896, a fierce tornado touched down about 6 miles west of the Eads Bridge in St. Louis leaving a mile-wide swath of destruction that killed 137 people in the city. Another 118 were killed after the twister crossed the Mississippi River and pummeled East St. Louis, Ill. All told, nearly 9,000 buildings were either damaged or destroyed.

Pictured is the D. M. Osborne & Co. warehouse on the corner of 22nd and Gratiot streets. The sturdily built structure covered one-half city block. Its entire west wall and fourth floor were destroyed and contents, such as mowers, binders and other heavy agricultural machinery were deposited in the street, along with bricks and structural debris.

The long-lived tornado blitzed across Illinois and into the eastern U.S., continuing its deadly and ruinous path. In 2009 U.S. dollars, the storm is estimated to have caused \$3.8 billion in damage and more than 284 fatalities.

The photo is part of the National Oceanic and Atmospheric Administration's central library, www.photolib.noaa.gov.

Send your photo to "Time Exposures," c/o Missouri Resources, PO Box 176, Jefferson City, MO 65102-0176. Original photos will be returned via insured mail. Pre-1970 environmental and natural resource photos from Missouri will be considered. Please try to include the date and location of the picture, a brief description and any related historic details that might be of interest to our readers.

Monitors display kilowatt hours consumed, which is the same measurement used on electricity bills. Kill A Watt monitors can be used to calculate energy costs by hour, day, month or year. Using the results from the Kill A Watt, homeowners can make adjustments to reduce their overall energy use and lower monthly utility bills.

Rolla Public Library cardholders may contact the library at 573-364-2604 or stop by 900 Pine Street to re-

serve a monitor. Check with your local library or electric provider to learn whether they offer similar monitors.

\$1.7 Million to Clean Up GM site in Kansas City

The State of Missouri will receive access to \$1.7 million in funds from the General Motors bankruptcy settlement to cover costs associated with cleaning up the former Leeds Assembly Plant in Kansas City.

The settlement, negotiated by the department and Missouri Attorney General's Office, is part of the nationwide GM bankruptcy settlement.

GM manufactured automobiles at the 117-acre Leeds facility for nearly 60 years and those activities left a legacy of pollutants on the site. The bulk of these pollutants related to the disposal of paint wastes such as lead, arsenic, benzene and beryllium.

The \$1.7 million allocated for the Leeds cleanup will cover necessary remediation activities, such as site investigation, soil and drum removal, maintenance of a protective asphalt cap and groundwater monitoring.

LaBarque Creek Nominated Outstanding State Resource

LaBarque Creek in Jefferson County has been nominated to become an Outstanding State Resource Water.



An Outstanding State Resource Water is a surface water that provides outstanding recreational opportunities, supports valuable fisheries and wildlife habitat, has good water quality and is not significantly affected by human activities.

These designations are intended to meet federal Clean Water Act obligations requiring Missouri to adopt an antidegradation policy designed to prevent any reduction of water quality, especially in those waters having significant ecological or cultural value.

The creek was nominated by the LaBarque Creek Watershed Association. The final decision on the designation will be made by the Missouri Clean Water Commission.

For news releases on the Web, visit: dnr.mo.gov/newsrel/index.html.

For a complete listing of the department's upcoming meetings, hearings and events, visit the department's online calendar at: dnr.mo.gov/calendar/search.do.

Resource Honor Roll Governor Jay Nixon

The Missouri state park system has benefited from numerous supporters over the years but the support of one individual, Gov. Jay Nixon, produced one of the most significant benefits state parks have seen since the 1930s. In 2010, Gov. Nixon launched the State Parks Youth Corps, which provided jobs for more than 1,000 youths as they enhanced and improved Missouri's state parks and historic sites.

The SPYC was funded through the federal American Recovery and Reinvestment Act and is a cooperative partnership between the Division of State Parks and the Division of Workforce Development. After SPYC was launched, Gov. Nixon personally traveled across the state, bringing attention to the program and encouraging youths to take advantage of the opportunity. His support and personal attention were part of an overall effort to improve the state park system, bolster the state's economy and tourism industry while providing valuable work experience for youths.

Positions and responsibilities for the SPYC varied from routine maintenance work and trail construction to interpretation and social media efforts. In 2010, the youth corps members contributed more than 187,500 hours to the state park system. Examples of their accomplishments include reroofing more than 25 structures, developing 145 videos for the state park website and signing and blazing almost 650 miles of trail in 58 state parks.

Because of all the improvements accomplished, the program brought new energy to the state park system. It is often compared to the Civilian Conservation Corps, which first developed many of the



DNR photo by Scott Myers

Gov. Nixon and first lady Georganne visit Katy Trail State Park.

parks in the 1930s. Many of the buildings the youth corps members repaired were built by the CCC in the 1930s.

The program was so successful in 2010 that it is being continued in 2011. The goal is to employ 600 youths to assist in state parks from April 1 through Nov. 30. This will help ensure that the benefits will continue to increase and be sustained into the future.

Gov. Nixon and the State Parks Youth Corps were recognized with the President's Award from the National Association of State Park Directors in 2010 for this innovative program.

Rock Matters



Galena

Missouri's state mineral is the primary ore of lead and it is often mined for its silver. Today's green technology has offered new uses for galena, which was used in cosmetics as early as 3500 B.C.

DNR photos by Mark Gordon



Galena, a natural semiconductor and important mineral used in early wireless communication systems and predecessor to silicon, played a major role in advancement of the electronic tools and conveniences we enjoy today, from cell phones to TVs to Global Positioning Systems and an assortment of medical equipment.

The most abundant and widely distributed sulfide mineral, also known as lead sulfide, galena (PbS) is the primary ore of lead. A bluish-gray metallic luster identifies galena when freshly broken. Soft and brittle crystal masses break into perfect cubic fragments. Dull and gray when weathered, galena is about eight times heavier than water.

The earth abundantly yields galena in what is known as the Viburnum Trend in the Southeast Missouri Lead District, the world's most productive region. Galena was also at one time readily brought forth from the zinc-lead mines in the Joplin-Webb City area in southwest Missouri, known as the Tri-State District. Since 1720, galena has played an important role in the history and economics of Missouri and in 1967 the Missouri Legislature designated galena the official state mineral.

Today, galena has found notoriety in the "green technology" arena as in the case of lead-cadmium-sulphide solar cells in which this essential element is sprayed as a thin layer on a solar panel and acts as a semiconductor. It is generally used in vehicle batteries, in the manufacture of pipe, wheel weights, electronics and communications equipment, and for soldering material to join metals.

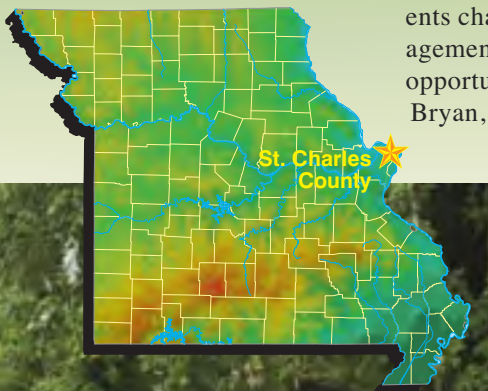
Popular with rock hounds, this attractive mineral has been used for many purposes for more than 3,000 years. It was the crystal in crystal radio sets in a bygone era when possibly your grandparents or great grandparents built radio receivers using round oatmeal boxes, lengths of copper wire, headphones and a little cat's whisker with crystal (now modern semiconductor diodes) from the local hardware store.

Galena, Mo., near Branson and Table Rock Lake in Stone County, was named for this mineral. Fourteen American towns are similarly named. Galena is also the official state mineral of Wisconsin and three United States Navy vessels were named USS Galena.

EDWARD “TED” AND PAT JONES-CONFLUENCE

by Tom Uhlenbrock

(Below) Ken McCarty with Missouri State Parks explains the value of the wetland habitat as local school children prepare to plant trees as part of the area restoration.



When planners first discussed building a state park where America’s two greatest rivers come together, they knew it would not be easy but they also knew it would be worth the effort.

“Creating a state park where the Missouri and Mississippi come together presents challenges for development and management but it also creates great opportunities for the public,” said Bill Bryan, Missouri State Parks Director.

At Edward “Ted” and Pat Jones-Confluence Point State Park, the biggest challenge is frequent flooding. The opportunities are for visitors to experience a historic wetland landscape and visit a place unlike any other in the United States.

Located near West Alton in St. Charles County, the 1,121-acre park contains the point where the Mississippi and Missouri rivers combine into one. The management goal is to restore the area’s historic natural environments to what the early travelers and botanists found. Timothy Flint described the landscape in 1828 as a beautiful prairie “dotted with green islands of wood,” with a blend of ponds and marshes fringed by bottomland timber.

DNR photo by Scott Myers

Because of its low elevation, flooding occurs frequently. “They were careful about that in planning the amenities,” said Quinn Kellner, natural resource manager of the popular park.

“The kind of exhibits we have, they’ve been underwater for months but they clean up easily and they’re not impacted at all,” Kellner said. The exhibits explain the wetland restoration and history of the area, including Lewis and Clark’s Expedition in 1804.

The park first opened in 2004 as part of the commemoration of the Lewis and Clark Bicentennial. The park’s name honors the late businessman Ted Jones, and his wife Pat, who were generous contributors to establishing the Katy Trail State Park. The park will serve as a link in a regional effort to provide trail access all the way from the end of Katy Trail State Park in Machens to the Illinois border. The Danforth Foundation, Western Rivers Conservancy and the Great Rivers Greenway helped finance the initial purchase of the land with additional help from a grant from the U.S. Fish and Wildlife Service and the current partnership with the U.S. Army Corps of Engineers.

Important Visitors

A three-year drought followed the park’s opening in 2004, and flooding was not a problem. However, spring floods soon followed, including in 2010 when the park was closed for much of the summer due to high water and the resulting cleanup.

CONFLUENCE POINT STATE PARK



DNR photo by Scott Myers

But it reopened by fall, and Kellner led a walk out to the only place in the United States where you can put one foot in the Mississippi and the other in the Missouri.

As he predicted, the covered kiosk that has interpretative exhibits about river geology, the Native Americans who lived here and the visit of Lewis and Clark was in good shape. The only hint of the spring flood was the high-water mark still on the restroom building.

The walk headed on a paved path through a stand of trees out onto a spit of land that separated the two great rivers. The names of the rivers were imbedded in bronze in the concrete and a display explained that snow melting at the Continental Divide would be some 14,000 feet higher, and travel 2,800 miles, before reaching the point of confluence.

An even more impressive display was the gold ball on top of what looked like a flagpole. The ball marked the water level reached during the Great Flood of 1993.

"Since we're relatively new, people are discovering the park for the first time," Kellner said. "We get a fair number of international visitors who want to see the confluence. We get quite a few people from India – they bring whole families out to view it. "There is a lot of significance to a confluence in their culture. They value the site quite a bit."

The park also is valued by another important visitor – migratory birds and water-



DNR photo by Tom Uhlenbrock

fowl that arrive from the north each winter, including a large number of bald eagles who head south in search of unfrozen water.

"When the river gets ice on it, they really congregate around open water to feed on fish," Kellner said. "You can have a couple dozen eagles on the ice close to each other. It's a nice mix of adults and younger birds that don't have the white head and tail yet.

"We have great egrets for much of the year, and some snowy egrets. We get American white pelicans frequently. Trumpeter swans start showing up in early to mid-winter – usually in November and December. We get several dozen."

(Top) At Edward "Ted" and Pat Jones-Confluence Point State Park, the two greatest rivers in the United States, the Mississippi and Missouri, converge and provide a unique place for observation and contemplation. (Above) A walkway into the confluence area puts visitors in a great spot to view the two great rivers.



(Above) Volunteer Ed Bielik plants a burr oak tree in the park as part of the floodplain restoration effort.

(Below) The park's location on the Mississippi River flyway makes it a popular spot for many waterfowl and migratory birds such as these Trumpeter Swans.

DNR photos by Scott Myers.

Restoring the Floodplain

A significant partner in the wetland restoration is the U.S. Army Corps of Engineers, which owns half of the park and has a license agreement with state parks to manage that half. The Corps provides funding for restoration efforts through its Missouri River Recovery Program. The money has been used to build pools in the wetlands, re-establish plants and for labor.

"We're planting some 300 acres of wet prairie species – big bluestem, Indian grass, Virginia wild rye," Kellner said. The park has also added

hardwood species that would naturally occur in higher ground like burr oak, pin oak, swamp white oak, persimmon and pecan. Some ground is being allowed to naturally vegetate on its own, with lots of cottonwood and black willow.

The park staff got a helping hand from area fourth- and fifth-grade students who planted some 4,000 trees, and got a hands-on lesson in habitat restoration.

Because of its position between the two rivers, water often comes up in the park, feeding a mosaic of marshes and wetlands, and sometimes covering the roads. Kellner noted that one of the benefits of having the restored floodplain is it acts as a sponge to lower water levels in developed, populated areas along the river.

"We're draining two-thirds of North America between the two river systems," he said. "Restoring the floodplain helps hold the soil and diminish some of the impact of a flood."

A Welcome Mat

The Division of State Parks is not the only government agency that realizes the value of the real estate near the confluence.

Confluence Point State Park is off Highway 67 in northeast St. Charles County, just south of the bridge that crosses the Mississippi into Alton, Ill. The entrance of the park is marked with a sign that says Riverlands Migratory Bird Sanctuary, which is 3,700 acres of waterways and wetlands managed by the Army Corps of Engineers.

The road leads to the Melvin Price Locks and Dam on the Mississippi, which in winter is a magnet for birds because its outflow may be the only unfrozen water. The entrance to the park is just across the road from the locks and dam.

Also nearby is the Missouri Department of Conservation's Columbia Bottom Conservation Area, which is 4,318 acres. And U.S. Fish and Wildlife recently took over management of the 1,470 acres of Cora Island in the Mississippi.

That presents a total of more than 10,000 acres managed with wildlife in mind, presenting a vast welcome mat for migrating waterfowl in winter and a home for resident species year-round.

"It all works in conjunction," Kellner said. "I've never been in a setting where you've had so many agencies working toward a common goal."

Tom Uhlenbrock is a writer for the department's Division of State Parks.



careerconnection



Allan Clarke

On the Front Lines of Soil Conservation

by Kerry Cordray

photographs by Scott Myers

A childhood spent on a Jamaican banana plantation, a talent for kicking a soccer ball and a summer job mapping Missouri water pollution sources all eventually led to Allan Clarke's career helping Missouri farmers save soil and improve their local water quality.

Clarke is one of 11 district coordinators that work for the Missouri Department of Natural Resources' Soil and Water Conservation Program. The program's district coordinators provide technical support and training to Missouri's 114 Soil and Water Conservation Districts.

Raised on a cattle and banana farm on the island nation of Jamaica, Allan planned for a life involved in farming and studied plant and soil science at a Jamaican agricultural college. His life took a geographic detour when he was offered a scholarship to come to the United States to play soccer at Lincoln University in Jefferson City. While working on his bachelor's degree in agriculture at LU, he worked summer jobs traveling the state for the department to collect Global Positioning System data. This data helps pinpoint and map the outflows of hundreds of Missouri facilities that operate under water pollution permits.

When Clarke finished his degree in 2000, he began working part time in the department's Water Pollution Control Program. Shortly afterward, he accepted a full-time position as an environmental specialist for DNR's Jefferson City Regional Office, and later moved to the Kansas City Regional Office. In 2005, Clarke put his farm-



(Above) Bruce Logan and Allan Clarke go over the details of a planned grazing system in Moniteau County. (Below) Logan and Clarke mark the GPS location of a well that is scheduled to be decommissioned. The decommissioning must meet federal NRCS standards and specifications, and must be registered with the Department of Natural Resources' Wellhead Protection Section.



ing background to use as he accepted a new challenge as a cost-share coordinator for the Soil and Water Conservation Program.

In the summer of 2008, the SWCP launched a data management system that made the work of its staff much more efficient. Clarke's position soon changed to that of a district coordinator.

"My early few years as a cost-share coordinator were very paper intensive," Clarke said. "The introduction of the new computer system helped streamline our entire process, making the implementation of conservation projects much faster and easier for landowners, districts and DNR alike. As a district coordinator, we now can provide much more technical support and training with the districts than was possible for us in the past."

District coordinators are the front line of staff administering Missouri's Cost-Share Program. Funded by the parks, soils and water sales tax, the cost-share program annually helps thousands of Missouri farmers install soil and water conservation practices. It also provides a portion of the cost of many farming practices to protect area water quality, reduce different kinds of erosion, and manage animal waste, irrigation, pesticides and fertilizers for better local environmental quality. As a district coordina-

tor, Clarke works closely with district offices in 10 different counties in central and southwest Missouri. He makes sure landowners and staff in each of his assigned counties design and approve cost-share projects for the most cost-effective and environmentally helpful results.

Qualifications for a position as a district coordinator are the same as for a department environmental specialist, requiring a bachelor's degree from a college or university with at least 30 semester hours earned in one or a combination of the following fields: agriculture, agronomy, biology, chemistry, ecology, engineering, environmental science, forestry, geology, natural resource management, physical science, physics, soil conservation, soil science, wildlife management or other closely related subjects.

For more information about this job or other career opportunities with the Department of Natural Resources or other Missouri state agencies, visit the Office of Administration's website at:

[//oa.mo.gov/pers/applicants.htm](http://oa.mo.gov/pers/applicants.htm).

Kerry Cordray is division information officer for the department's Soil and Water Conservation Program and Water Resources Center.

Logan and Clarke examine frost-proof watering tanks that will be installed in a planned grazing system.



Diesel Emissions Reduction Act

Recovery Act Fuels Clean Air

by Mark Leath

photograph by Scott Myers

The American Recovery and Reinvestment Act dedicated \$300 million nationwide for Diesel Emissions Reduction Act projects. Thirty percent of this funding was allocated equally to each state and the District of Columbia. The remaining funding was part of a national competitive program for grants and loans dedicated to eligible clean diesel project activities.

The Department of Natural Resources' Air Pollution Control Program implements the state Clean Diesel Program, and was also awarded a competitive grant under the national program. The combined ARRA funding the department received for the two programs totaled approximately \$2.7 million.

Through both programs, the department targeted four areas of the state facing the biggest air quality concerns – Kansas City, St. Louis, Springfield and southeast Missouri. Sub grants were awarded to local organizations in each of these areas to implement their respective projects. Through these projects, 437 diesel vehicles and equipment, such as school buses, tractor-trailers, refuse haulers, concrete mixers, marine engines and locomotives were retrofitted, repowered or replaced.

Reducing diesel emissions in areas already facing air quality issues will have significant public health benefits. Diesel emissions contain air toxins with known human carcinogens, as well as pollutants that can combine to form ground-level ozone, the pollutant of most concern in Missouri.

These projects also resulted in significant economic benefits. Millions of dollars were paid to local vendors of retrofit equipment, engines and new vehicles. Hundreds of mechanic hours were spent installing the equipment. The efficiency improvements and fuel savings are expected to provide operational sustainability and savings to the fleets that were included.

In St. Louis, two tugboats were recently outfitted with engine retrofits for the ves-

sels' multiple propulsion diesel engines.

"The reduced emissions and fuel consumption will help our environment and economy for decades," said Dave Heyl, chief financial officer of JB Marine Inc., in St. Louis.

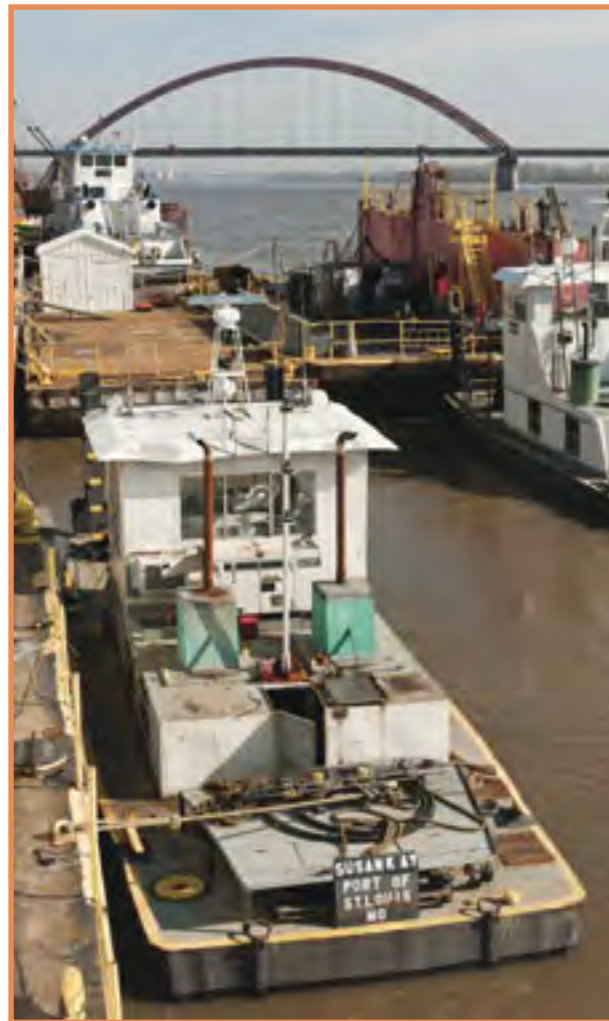
In Kansas City, five switch engine locomotives were retrofitted with automatic engine shutdown and startup. Mike Haverty, executive chairman of the Kansas City Southern Railroad, explained that the devices "significantly reduce a locomotive's parked idle time by automatically managing the [engine] shutdown and restart."

In the Springfield area, Hollister School District was awarded funds to begin an early school bus replacement for their fleet.

"We were able to purchase a new bus for the first time in more than five years and further our ongoing efforts to promote responsible stewardship of our environment," said Debbie Redford, public relations director and grant writer for the Hollister School District.

With air quality in Missouri's metro areas already feeling the squeeze of tighter EPA standards, the Diesel Emissions Reduction Act will help keep air quality compliance a reality.

Mark Leath is an environmental engineer with the department's Air Pollution Control Program and the project manager for both of the Recovery Act DERA grants.



With funds provided by the Diesel Emissions Recovery Act, JB Marine Inc. in St. Louis replaced the diesel engines in two of their tugs.



**MISSOURI DEPARTMENT
OF NATURAL RESOURCES**
PO Box 176
Jefferson City, MO 65102-0176

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